WHITEPAPER

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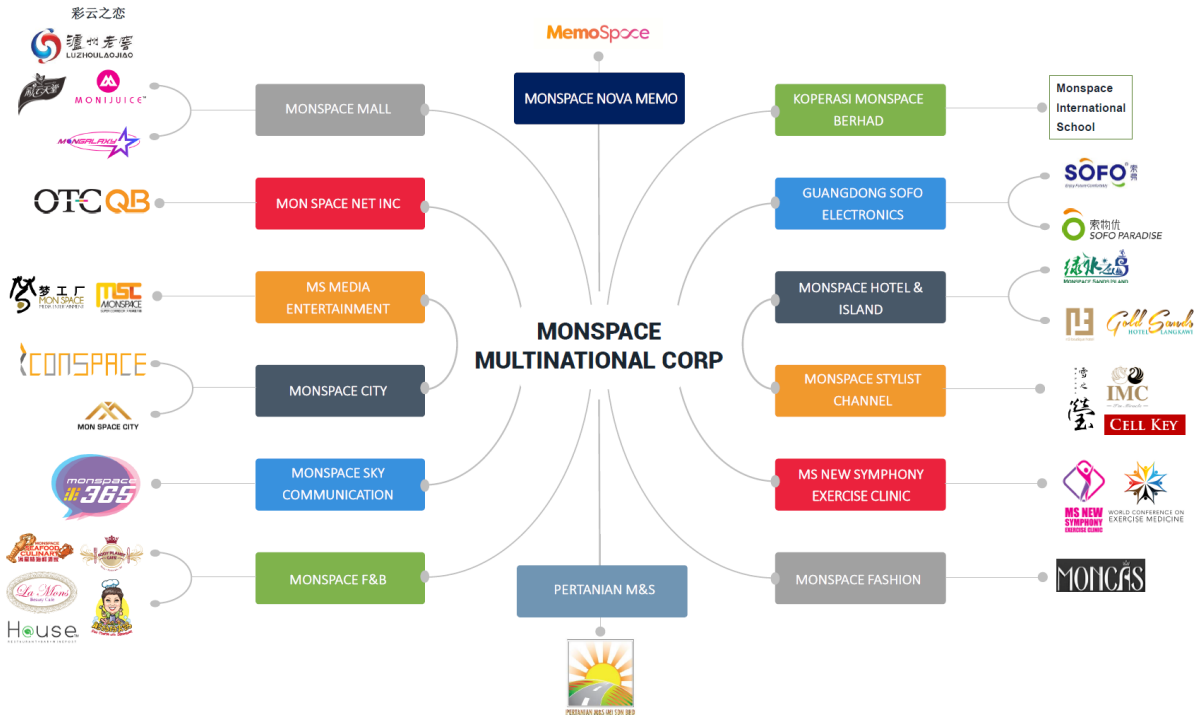
WHO WE ARE



Monspace is a multinational corporation with investments across Asia Pacific in eight primary sectors: telecommunication, real estate, technology, finance, entertainment, aviation, hospitality, food, and beverage.

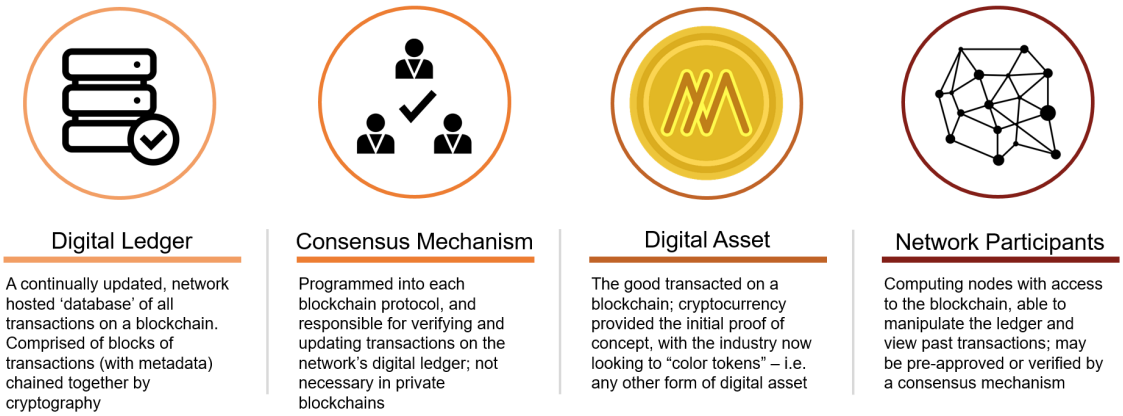
As one of the region's leading conglomerate, Monspace Multinational Corp has continued to deliver strong top and bottom line growth through consistent profitability & successful investment strategies over the years.

Our vision is to be a leading multinational corporation, creating sustained growth for our core operations in all industry sectors we are in and to be a strong promoter of economic & social growth globally, starting with Asia.

We strive to provide quality products and services to consumers while remaining a responsible corporation committed to transparency and top quality management. We pursue innovation and increase our competitiveness through the use of modern technology & architecture and that allows us to stay abreast of the market. And of course one of the hottest technologies of 2017 – blockchain – couldn't escape our attention.

WHAT IS BLOCKCHAIN TECHNOLOGY

A blockchain is a digital ledger distributed across several computers that is used to record transactions so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network. This results in a robust workflow where uncertainty regarding data security is minimal.



Think of blockchain as a transformative way to establish trust, transparency, and efficiency

Using a blockchain removes the characteristic of infinite reproducibility from a digital currency. It confirms that each unit of value was transferred only once, solving the long-standing problem of double spending (an error in a digital cash schemes in which the same single digital token is spent more than once).

The most popular application of blockchain technology nowadays is cryptocurrency. Cryptocurrencies are essentially just digital money, digital tools of exchange that use cryptography, and the aforementioned blockchain technology to facilitate secure and anonymous transactions.

$60 billion
Total market capitalization of all cryptocurrencies[1]

2.9+ million
The current number of unique active users of crypocurrency wallets[2]

91%
Of 200 banks surveyed by IBM Institute are investing in blockchain solutions[3]

REVOLUTIONIZING THE TRADITIONAL BUSINESS NETWORK

With traditional methods for recording transactions and tracking assets, participants on a network keep their own ledgers and other records, as shown in the picture on the left in Figure 1-1. This traditional method can be expensive, partially because it involves intermediaries that charge fees for their services. It's clearly inefficient due to delays in executing agreements and the duplication of effort required to maintain numerous ledgers. It's also vulnerable because if a central system (for example, a bank) is compromised, due to fraud, cyberattack, or a simple mistake, the entire business network is affected.

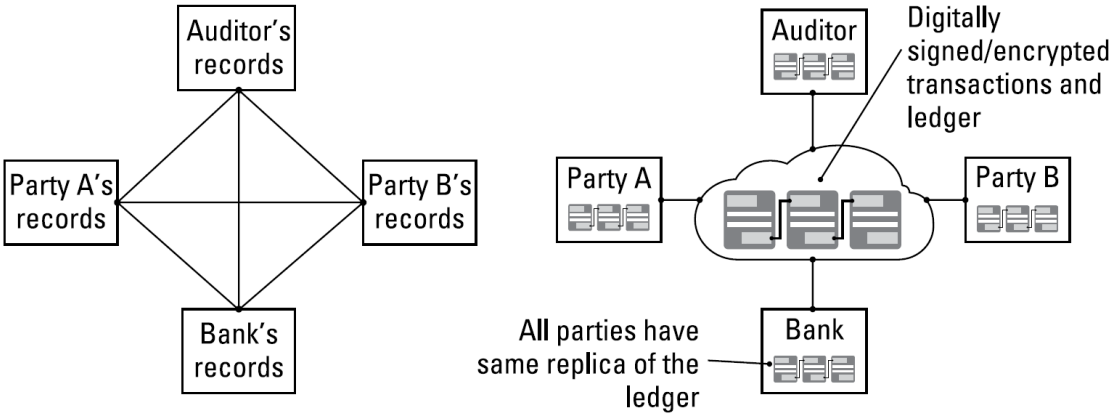


Fig.1-1 Business networks before and after blockchain

[1] https://www.coindesk.com/cryptocurrency-market-cap-tops-60-billion-hit-time-high/
[2] https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf
[3] https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBP03467USEN&

The picture on top in Figure 1-1 represents business networks that use blockchain. The blockchain architecture gives participants the ability to share a ledger that is updated, through peer-to-peer replication, every time a transaction occurs. Peer-to-peer replication means that each participant (node) in the network acts as both a publisher and a subscriber. Each node can receive or send transactions to other nodes, and the data is synchronized across the network as it is transferred.

The blockchain network is economical and efficient, because it eliminates duplication of effort and reduces the need for intermediaries. It's also less vulnerable because it uses consensus models to validate information. Transactions are secure, authenticated, and verifiable.

The participants in both transaction systems are the same. What has changed is that the transaction record is now shared and available to all parties.

EXPLORING A BLOCKCHAIN APPLICATION

Car companies make leasing a vehicle look easy, but in reality, it can be quite complicated. A significant challenge faced by today's car leasing networks is that even though the physical supply chain is usually integrated, the supporting systems are often fragmented.

Each party within the network maintains its own ledger, which can take days or weeks to synchronize (see Figure 1-2).

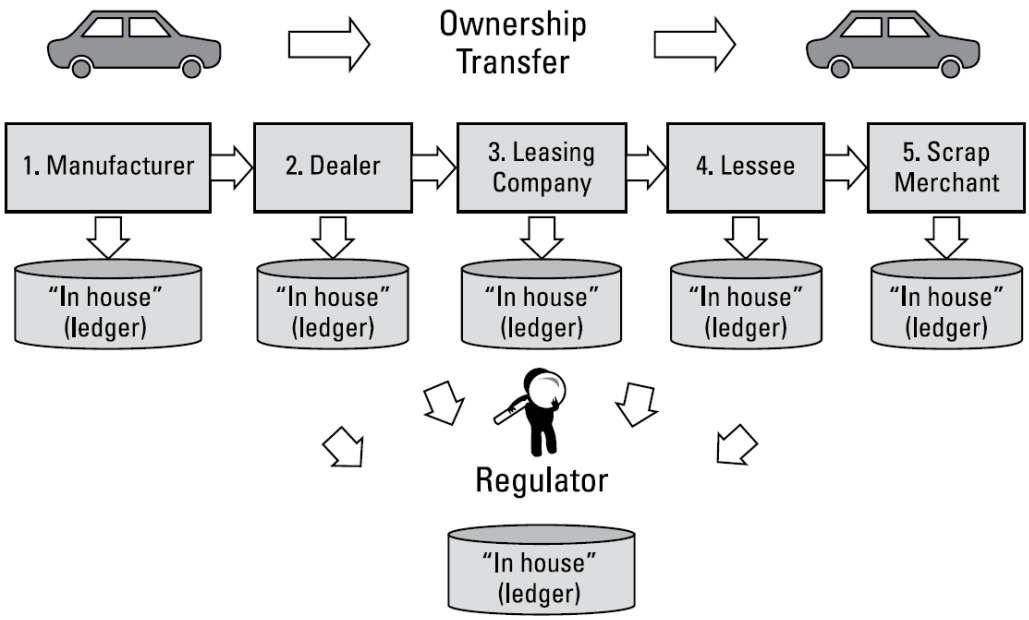


Fig.1-2 Tracking vehicle ownership without blockchain

By using a shared ledger on a blockchain network, every participant can access, monitor, and analyze the state of the vehicle irrespective of where it is within its life cycle (see Figure 1-3).

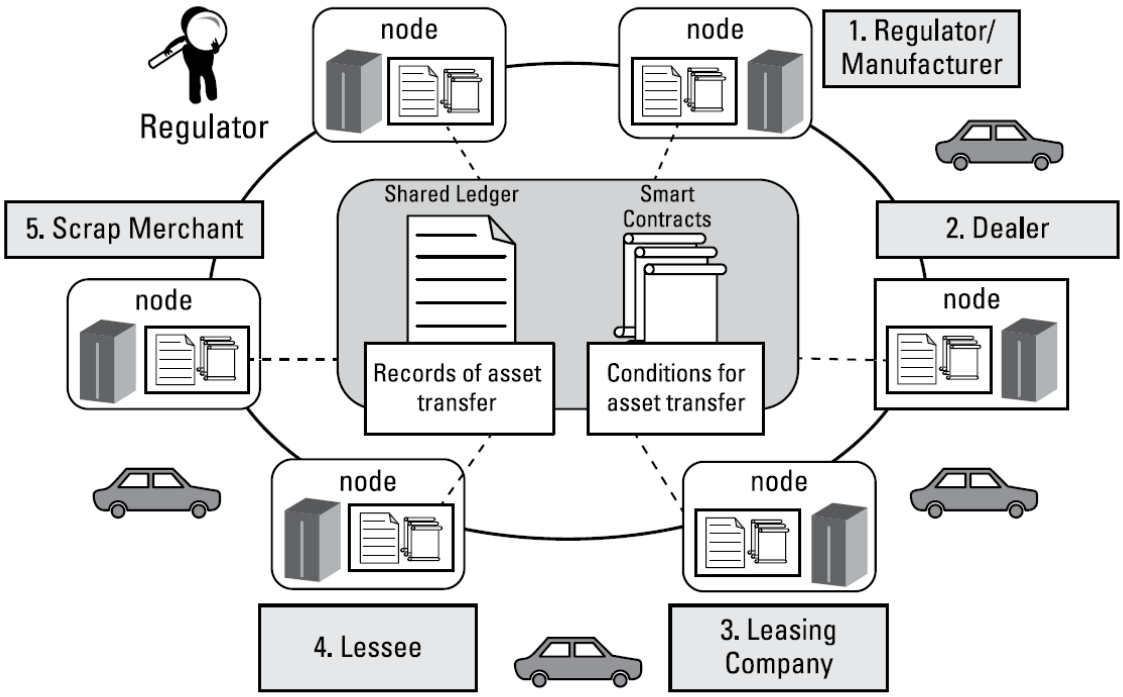


Fig.1-3 Tracking vehicle ownership with blockchain

WHY IT'S CALLED "BLOCKCHAIN"

Blockchain owes its name to the way it stores transaction data — in blocks that are linked together to form a chain (see Figure 2-1). As the number of transactions grows, so does the blockchain. Blocks record and confirm the time and sequence of transactions, which are then logged into the blockchain, within a discrete network governed by rules agreed on by the network participants.

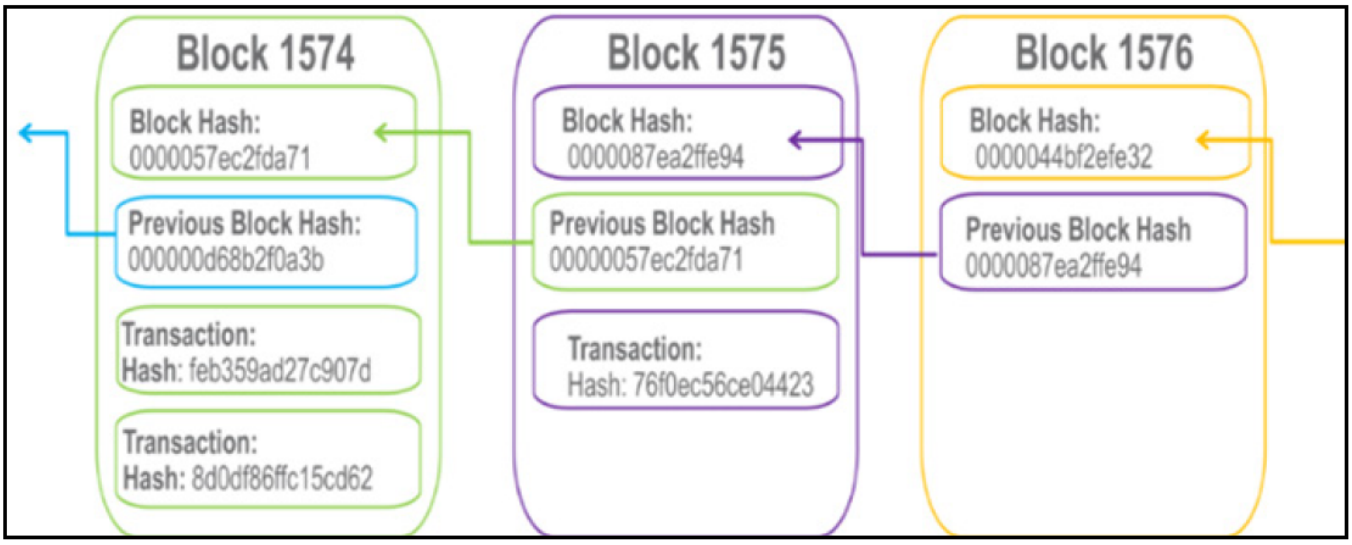
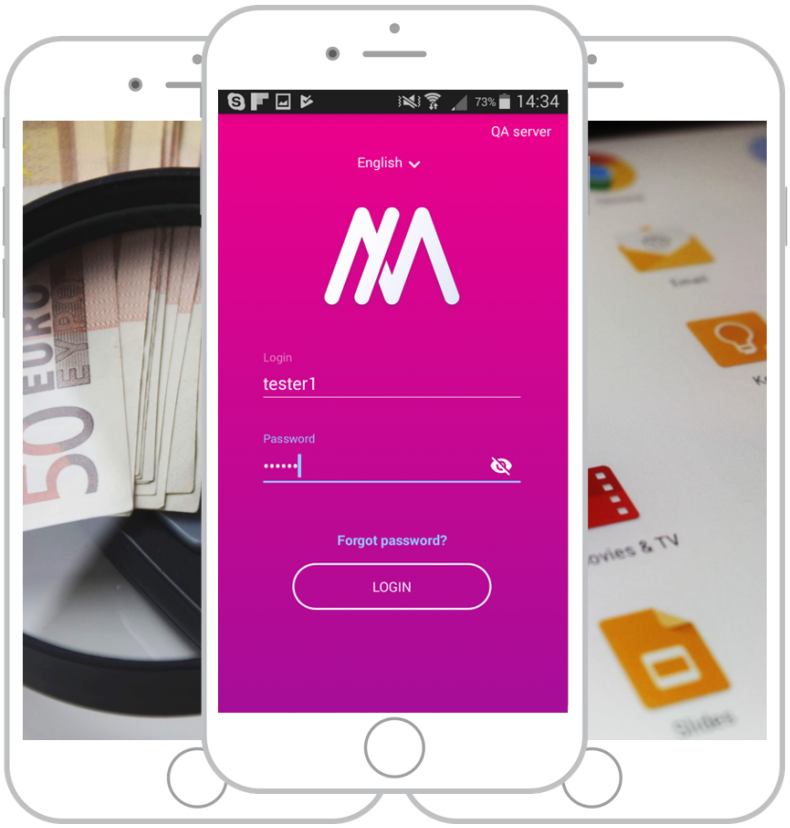


Fig. 2-1 Blockchain stores transaction records in a series of connected blocks

Each block contains a hash (a digital fingerprint or unique identifier), timestamped batches of recent valid transactions, and the hash of the previous block. The previous block hash links the blocks together and prevents any block from being altered or a block being inserted between two existing blocks. In this way, each subsequent block strengthens the verification of the previous block and hence the entire blockchain. The method renders the blockchain tamper-evident, lending to the key attribute of immutability.

OUR PRODUCT

MSD is a secondary currency (token) based on one of the most popular blockchain – Ethereum.



MSD can be accessed using browser on PC and native mobile application (on Android and iOS).

The New Cryptocurrency project aimed to design and implement independent crypto currency based on Distributed Ledger technology. User should be able to perform the following operations with the currency:

- Create personal wallets
- Transfer currency tokens between different wallets
- Monitor balance of personal wallet
- Use the currency tokens to pay for selected goods and services from available merchants

MSD DISTRIBUTION

- 30.000.000.000 MSD were emitted
- 4.047.660.243 MSD are currently in the users' wallets
- 25.952.339.756 MSD are held in reserve

The data is based on values from the end of October. MSD were granted to users by Monspace on the basis of their performance and contribution that they made to the company's development. There are no MSD reserved by the product owners or developers or any other team members. The administrator has the right to release tokens into circulation through the distribution of tokens to users as part of the company's loyalty program, thus acting as a centralised distributor.

FRONT-END SOLUTION OVERVIEW

High-level overview of web-application

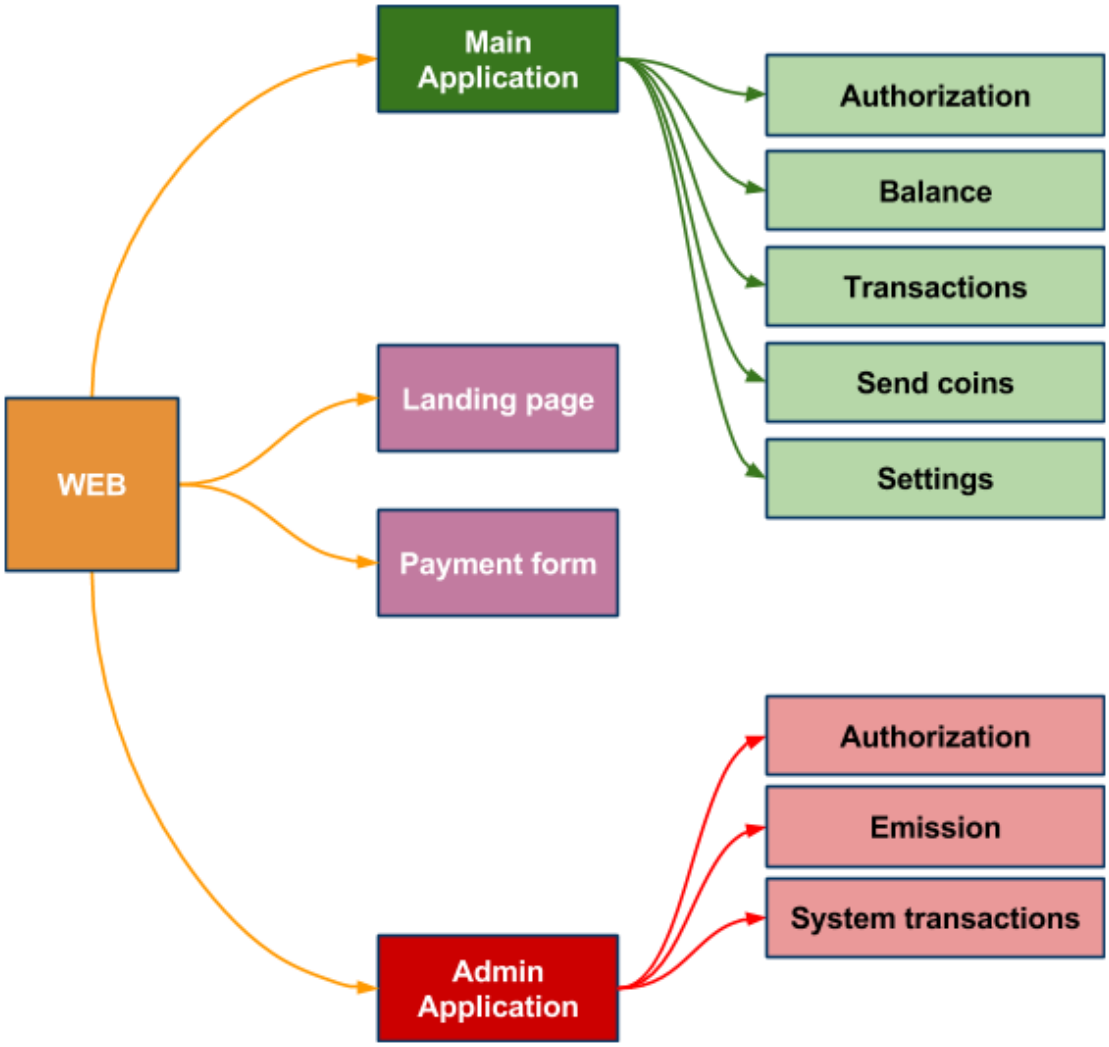
UI LAYER
Web-pages and grid with all elements

BUSINESS LOGIC LAYER
Rules for data input and restrictions for interaction with UI layer

DATA LAYER
Data processing code

BACKEND API
Server side which processes web requests and gives data for web-application

WEB-APPLICATION FUNCTIONAL OVERVIEW



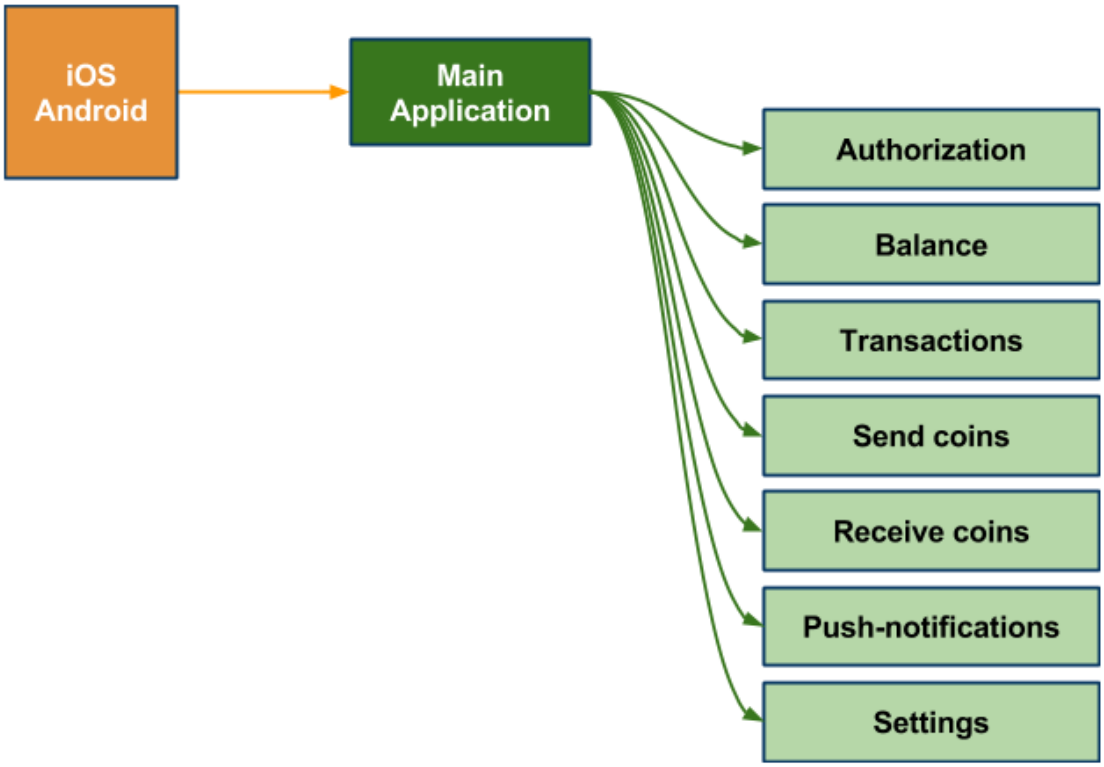
MAIN APPLICATION
Client application where only MonSpace Mall users can to login.

ADMIN APPLICATION
Application for administrator to manage balances and transactions.

LANDING PAGE
Standalone page with information about application and links to login into web-application or download mobile app.

PAYMENT FORM
Web-form for merchants to get payment from user.

MOBILE APPLICATION FUNCTIONAL OVERVIEW

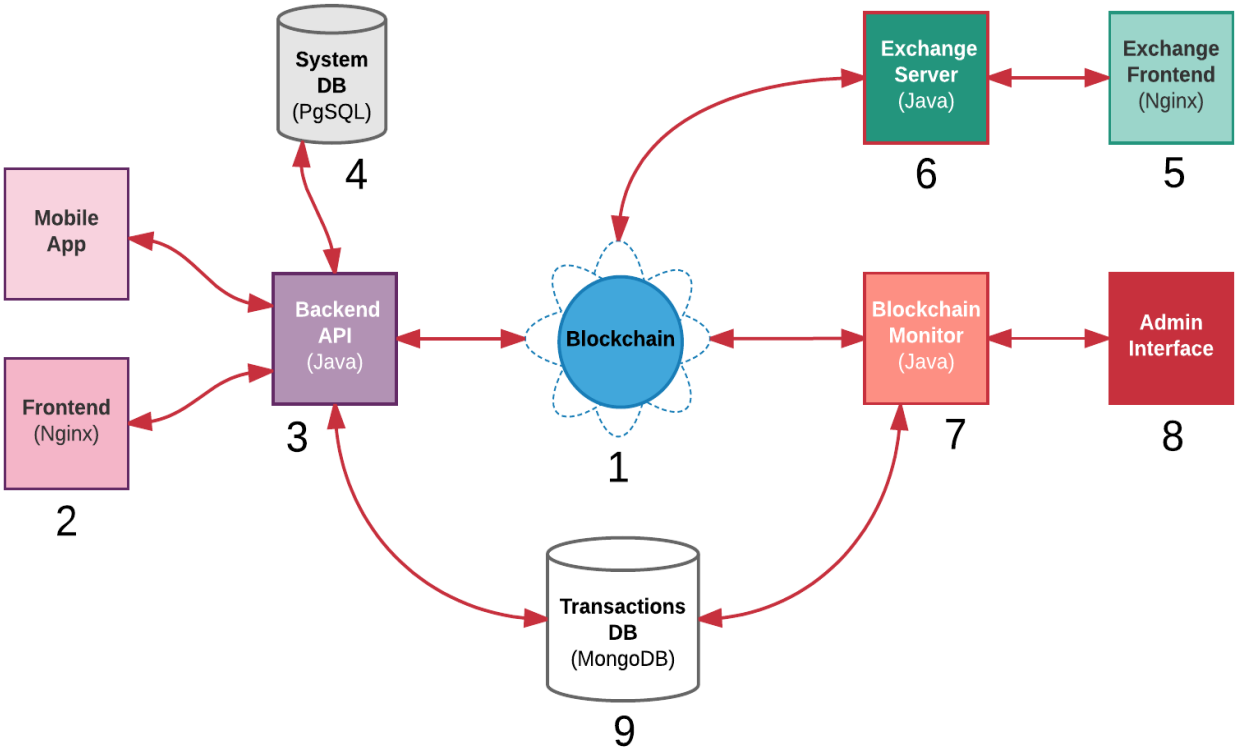


Mobile application has almost same functionality as web-version but have additional features, e.g.:

- QR-code scanner with device camera
- Unlock application with PIN-code or fingerprint
- Push-notifications

BACK-END SOLUTION OVERVIEW

The following picture describes the proposed solution architecture from a "bird's eyes" view:



MAIN COMPONENTS

1) BLOCKCHAIN

A fork of the world-known Ethereum blockchain platform in a "Private" mode. In this configuration all blockchain nodes are situated inside the system and cryptocurrency users should use one of client applications to connect the currency backend functionality.
Business logic implemented using Ethereum "smart contracts" – code blocks executed distributedly and shared between all nodes in blockchain network.

2) FRONTEND

Client applications providing basic user interfaces to work with the currency. There are several applications for different platforms: web browser, iOS and Android native clients.

3) **BACKEND API**
Server side application responsible for processing user requests and dispatching them into the internal blockchain network and storage components. Backend API provides REST interface and consists of two parts:
   a) **Private API** – set of REST endpoints available only for internal applications including the Frontend and Exchange
   b) **Public API** – REST endpoints open to external applications for integration with the Cryptocurrency Platform

4) **SYSTEM DB**
Relational database to store non-blockchain data (website accounts and configuration details)

5) **EXCHANGE FRONTEND**
Client application providing user interface for the Currency Exchange

6) **EXCHANGE SERVER**
Server side application implementing business logic of the Currency Exchange. Exchange Server provides REST interface and could be considered as an extension to the Backend API.

7) **BLOCKCHAIN MONITOR**
Server side application monitoring blockchain events (blocks, transactions) and logging them into Transaction DB for future search and analysis.

8) **ADMIN INTERFACE**
Client application providing user interface for system management and monitoring

9) **TRANSACTION DB**
Fast scalable data storage used for storing transaction events.

BLOCKCHAIN DETAILS

The MSD system is based on a private blockchain that works on the Ethereum platform.

The MSD Token itself is based on Ethereum smart-contract and is designed with ERC20 standard in mind.

You can find a description of the standard by following the link: https://theethereum.wiki/w/index.php/ERC20_Token_Standard

The following samples are fragments of the MSD token contract that demonstrate how the contract maintains MSD balance of accounts.

BALANCE INFO

```
mapping (address => uint256) public balanceOf;
```

This field stores the balances of each account. So it provides the opportunity to get the balance of a particular account.

TOTAL SUPPLY INFO

```
uint256 public totalSupply;
```

This field stores information about total amount of MSD tokens in the system.

TRANSFER EVENT

```
event Transfer(
    address indexed from,          // sender
    address indexed to,            // receiver
    uint256 amount,                // amount transferred
    uint256 senderBalance,         // sender balance after transfer
    uint256 receiverBalance,       // receiver balance after transfer
    uint timestamp,                // date and time of transfer
    string comment,                // commentary
    TransferType transferType      // type of transfer (SYSTEM or USER)
);
```

This structure represents an event in the blockchain that is triggered in the blockchain when MSD tokens are transferred.
TransferType can be USER or SYSTEM.
SYSTEM means that transfer is initiated by admin.
USER means that transfer is initiated by user.

TRANSFER FUNCTION

```
function transfer(address from, address to, uint256 amount, string
comment, TransferType transferType) private {
	if (amount <= 0) revert();
	if (balanceOf[from] < amount) revert();
	if (balanceOf[to] + amount < balanceOf[to]) revert();
	balanceOf[from] -= amount;
	balanceOf[to] += amount;
	Transfer(from, to, amount, balanceOf[from], balanceOf[to], now,
comment, transferType);
  }
```

This private function is used internally to process transfers within the smart-contract. It is not accessible from outside, but other public methods that transfers MSD are based on it.

TRANSFER FROM USER FUNCTION

```
function transferFromUser(address to, uint256 amount, string comment) {
	transfer(msg.sender, to, amount, comment, TransferType.User);
}
```

This function is designed to transfer MSD tokens between users. It can be initiated by any user that wants to make a transfer.

The sender here is a user that sends a transaction to the blockchain. They sign the transaction data with their credentials.

This is how it looks for the user:

- The user creates a request in the application to transfer MSDs to another user and sends it to server;
- The server finds their credentials and sends the transaction to the blockchain from this user to our smart-contract with transfer data signed by the user's credentials;
- The smart-contract executes the transfer;
- Finally, this transaction is processed by miners and gets added to a new block in the blockchain.

All transfers can have comments and these comments will be shown in the application.

Transfer From System to User

```
function transferFromAdmin(address to, uint256 amount, string comment) onlyOwner {
    transfer(msg.sender, to, amount, comment, TransferType.System);
}
```

This function is designed to transfer MSD tokens from the system to a user. It can be executed only by a contract creator.

It is used to make a gift of coins according to the business achievements of a user in the Network.

This kind of transfers has SYSTEM type.

Batch of Transfers

Additionally we created a copy of the transfer functions to process a batch of transfers in one transaction to solve performance issues.

So we just reuse the transfer function in a cycle. It has shown better performance in our network.

Batch Transfer From User

```
function batchTransferFromUser(address[] senders, address[] receivers,
uint256[] amounts, string comments, string delimiter) onlyOwner {
	var commentsSlice = comments.toSlice();
	var delim = delimiter.toSlice();
	var commentCount = commentsSlice.count(delim) + 1;

	if (senders.length != receivers.length || senders.length !=
amounts.length || senders.length != commentCount) {
		revert();
	}

	for (uint i = 0; i < receivers.length; i++) {
		transfer(senders[i], receivers[i], amounts[i],
commentsSlice.split(delim).toString(), TransferType.User);
	}
}
```

Batch Transfer From Admin

```
function batchTransferFromAdmin(address[] receivers, uint256[]
amounts, string comments, string delimiter) onlyOwner {
	var commentsSlice = comments.toSlice();
	var delim = delimiter.toSlice();
	var commentCount = commentsSlice.count(delim) + 1;

	if (receivers.length != amounts.length || receivers.length !=
commentCount) {
		revert();
	}

	for (uint i = 0; i < receivers.length; i++) {
		transferFromAdmin(receivers[i], amounts[i],
commentsSlice.split(delim).toString());
	}
}
```

IMPLEMENTATION DETAILS

	Component	Implementation
1	Blockchain	Ethereum - geth 1.6.0+
2	Frontend	Angular JS 4.0
3	Backend API	Java Spring 4
4	System DB	PostgreSQL 9
5	Exchange Frontend	Angular JS 4.0
6	Exchange Server	Java Spring 4
7	Blockchain Monitor	Java Spring 4, web3j
8	Transaction DB	MongoDB 3.4

MSD
Coin trading symbol for MSD

0
Transfer fee for transactions

30 billion
Total amount of coins to be issued

1 million
The number of loyal user from the start

0.1 USD
Estimated value of each coin

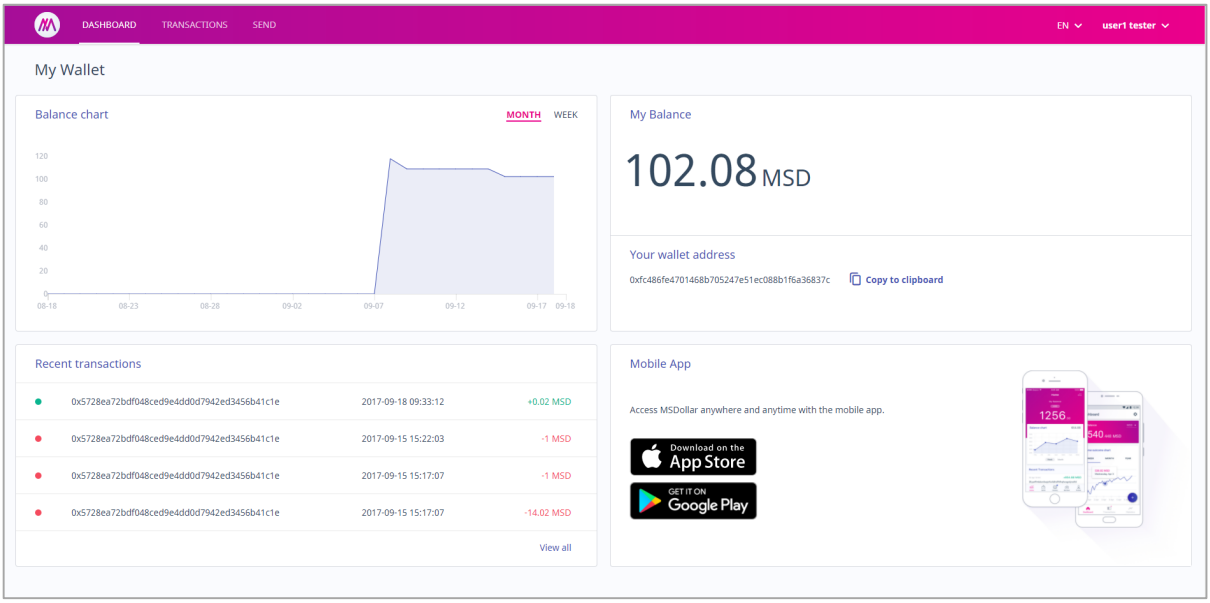


Fig.1 Web version of MSD

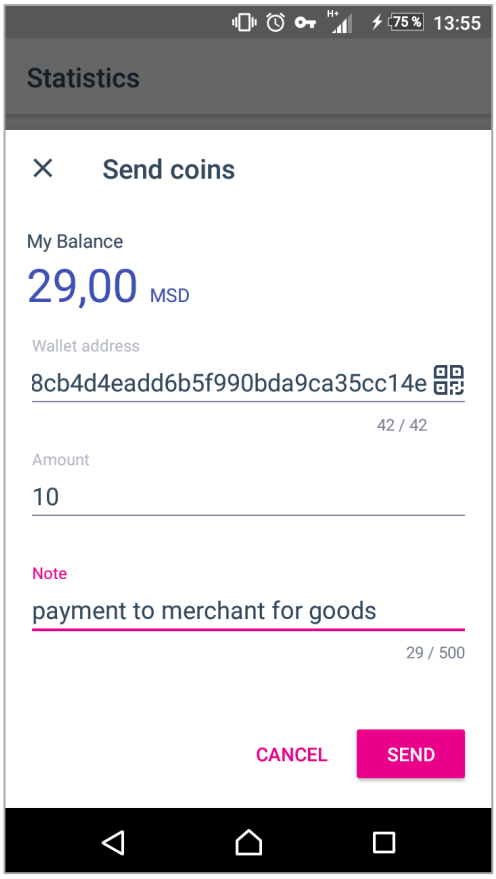


Fig.2 Send Coins feature on Android version of MSD

OUR PARTNERS

One of the main issues when you launch new cryptocurrency is the lack of a significant user base to adopt the currency. MSD is launched in cooperation with the MonSpace corporation that has a wide network of loyal affiliates.

These affiliates currently use an internal virtual currency, which will be converted to MSD, and in that way the new cryptocurrency will receive the support of 3.5 million loyal users from the start. Moreover, MonSpace has a large ecosystem, which includes e-shops and merchants that will begin accepting MSD, so that users will be able to book hotels or pay in restaurants using the coin.

宇天教育城
MONSPACE MALL

Giant B
جا ين بي
SINCE 1978

Fat Mama with Steamboat

NJOY PLANET CAFE
Music • Restaurant • Bar

MASTER MAX TRADING

House
RESTAURANT • BAR • WINEPOST

Mark RED™

MONGALAXY

Gold Sands
HOTEL LANGKAWI

TEFII
SOLUTION RESOURCES

9898
Your Kampung Friend

IDEAHOM®
Great Ideas . Great Lifestyle

MSC
MONSPACE
SUPER CORRIDOR 大马满星大道

La Mons
Beauty Cafe

Stylist
MONSPACE CHANNEL

MONSPACE
SEAFOOD
CULINARY
满星楼海鲜酒家

MONSPACE SANDS ISLAND

MS NEW SYMPHONY
EXERCISE CLINIC

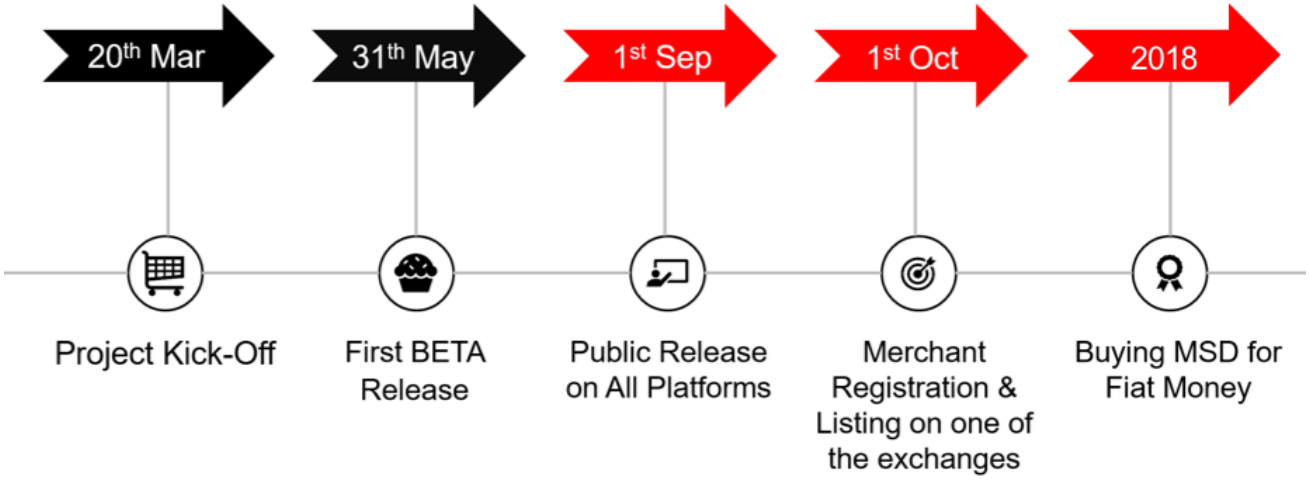
MemoSpace

monspace
365

n3 boutique hotel

ROADMAP & TIMELINE

OVERVIEW



FEATURES IMPLEMENTED BY 2017 SEPTEMBER 1ST

Authorization

- Through monspacemall.com

Private Cryptocurrency

- Balances/wallets in the block chain
- Transactions between users/wallets
- Email notifications for new transactions

Mobile applications iOS and Android

- Balance
- Transactions history
- Send/receive coins
- Submission to Apple Store and Google Play

3rd Party Integration-Ready (Merchant)

- Authorization
- Balance check
- ‘Use coins’ call

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